National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035-1000

Sole Source Justification
(FAR 13.501(a)(1)(ii)

Summary Information:

Initiating Office:	NASA Ames Research Center
Purchase Request No.:	4200407575
Procurement Title:	Blanket Purchase Order (BPA) – La Vision, Inc.
Total Estimated Value:	FOIA Ex. 5
Period of Performance:	September 26, 2011 – September 25, 2016
Statutory Authority:	*Section 4202 of the Clinger-Cohen Act of 1996 (FAR 13.500(d) allows use through January 1, 2012))*

This Sole Source Justification has been prepared in accordance with the following requirements:

(1) Federal Acquisition Regulation *(FAR) 12.203, and 13.501(a)(1)(ii) - using the format of FAR 6.302-2 as prescribed by FAR 13.501(a)(1).*
(2) Section 4202 of the Clinger-Cohen Action of 1996 (FAR 13.500(d) allows use through January 1, 2012))

FAR Part 12.203 authorizes the use of simplified procedures for the acquisition of commercial items in amounts greater than the simplified threshold but not exceeding FOIA Ex. 5. Specifically, FAR 13.5, Test Program for Certain Commercial Items authorizes the issuance of solicitations under test program for commercial items through January 1, 2012. Additionally, FAR 13.501 (a)(1)(ii) directs that sole source justifications use the format at FAR 6.303-2, modified to reflect an acquisition under the authority of the test program for commercial items (section 4202 of the Clinger-Cohen Act of 1996). Thus, this sole source justification is issued to document the reasons that La Vision, Inc.'s (La Vision) commercially available software, software upgrades, software licenses, and associated equipment are uniquely qualified to meet the Government's requirements.

Detailed Information:

A. Nature and/or description of the action being approved.

FAR Part 12.203 authorizes the use of simplified procedures for the acquisition of commercial items in amounts greater than the simplified threshold but not exceeding FOIA Ex. 5. NASA Ames Research Center (ARC) proposes to negotiate a sole source Blanket Purchase Agreement (BPA) for the acquisition of La Vision's commercially available software, software upgrades, software licenses, and associated equipment that will be used for Particle Image Velocimetry (PIV) data capture and analysis. The BPA will be for a base period of 5 years with no options. The Government estimates that the volume of purchases through this agreement will not exceed FOIA Ex. 5 for the full five years.

The acquisition of La Vision, Inc. commercially available products and services under FAR 13.5, Test Program for Certain Commercial Items will enable Ames Research Center researchers to obtain the necessary equipment required to support three FY12 currently scheduled tests. The first will characterize high-velocity metal particles interacting with a variety of materials in the

Ames Vertical Gun facility. The second is the wake and slipstream of a tractor-trailer model in the Army 7x10 Wind Tunnel, and the third is to characterize the wake of the Multi Purpose Crew Vehicle (MPCV) in the descent configuration in the Ames Unitary 11-foot Wind Tunnel. Results of these tests will help validate the computational models of the flow fields developed by the researchers.

B. Description of the supplies or services required to meet the agency's needs (including estimated value).

NASA Ames, Langley, and Glenn Research Centers have required the unique, commercially available, La Vision, Inc., products and associated equipment to support wind tunnel research, data capture and analysis since 2005. In FY2007, La Vision, Inc.'s PIV systems became the standard at all three Centers. These three NASA Centers have a continued requirement for the commercially available La Vision, Inc., Da Vis software packages, software upgrades, licenses, and associated equipment. La Vision owns all proprietary rights for its software, licenses, upgrades, and associated PIV products. Additionally, La Vision products cannot be obtained through any other source of supply. La Vision also has no Channel – Partnering arrangements, nor does it authorize any other Software/Hardware supplier or vendor to market and sell its products.

As the research at NASA's Centers involves the continuous increase of both camera size and pixels, faster processing time has evolved from merely an additional benefit into an absolute necessity. Therefore, Process Scheduling has become one of the primary research concerns where NASA researchers try to take advantage of the speed of GPU processors. La Vision's GPU processor speed meets and/or exceeds other commercially available PIV systems. As the La Vision PIV system is an integrated system, whereby all component parts must work in concert with each other, and because NASA Ames, Langley and Glenn Research Centers have utilized La Vision PIV systems and associated products in their Wind Tunnel data capture and analysis since 2007, any attempt to switch to a different supplier's system would have an adverse impact on ongoing and future research, as well as previously gathered research data. Additionally, there still is no PIV system provider on the market today whose PIV system meets or exceeds requirements at the three NASA Centers.

Additionally, there is a recurring need for additional licenses for PIV (Particle Image Velocimetry) processing software and calibration target software licenses for stereo PIV. PIV is used in wind tunnel testing to determine flow velocities and turbulence quantities by measuring the displacement of particles in the air. The PIV software will be used for post-processing of particle displacement images acquired through various digital PIV cameras in two-dimension and stereo recording modes.

The need for velocity data around wind tunnel models is required by aircraft and space craft designers, computational fluid mechanists, and scientists attempting to gain understanding of basic fluids and particle behavior. The technique is not limited to wind tunnel testing and is used in other NASA facilities, including the Vertical Gun Range at ARC mentioned above. It is commonly used in turbo-machinery to characterize sprays, in ballistic ranges, and water channels. In addition, test customers require specific equipment for each test. This technique has been used at NASA/Ames, Langley, and Glenn Research Centers for more than a decade. The effectiveness and accuracy of the measurement system is continuously improving, thus a certain year-to-year investment to maintain high standards is necessary.

Currently, ARC has a need for La Vision's Vision Research v641, a second-generation camera which is smaller and lighter than its predecessor, the v640, and includes many new features

required by researchers performing PIV data capture and analysis. The commercially available v641 provides a 4 megapixel sensor, and greater than 6 gigapixels/second throughput (this translates to full resolution frame rates of 1450 frames-per-second (fps)) and 1920 x 1080 HD-resolution frame rates of 2560 fps. The minimum frame rate is 10 fps. This camera enables the user to keep moving targets in-frame longer and to see more of the event being recorded. This camera will also integrate easily with the existing systems in use at all NASA Centers.

NASA Langley has a requirement for PIV system software upgrades that are used to measure flow velocities and turbulence quantities in the 14 x 22 Foot Subsonic Wind Tunnel and the Rotor Test Cell. Upgrades to the Da Vis system and processing software along with the ability to process PIV image data using Graphical Processing Units (GPUs), will allow data to be available for use by researchers in near-real time (when conducting tests). Having information available to researchers in near-real time will improve their decision-making associated with the data captured and analyzed and result in increased tunnel productivity.

Additionally, there is an on-going need at all three Centers for other La Vision commercially available items and services discussed above, all of which will be within the SAP threshold of FOIA Ex. 5 under the Test Program for Commercial Items.

C. An identification of the statutory authority permitting other than full and open competition.

Section 4202 of the Clinger-Cohen Act of 1996 *(FAR 13.500(d) allows use through January 1, 2012))*

D. Demonstration of the proposed contractor's unique qualification or the nature of the acquisition requires use of the authority cited.

The commercially available PIV software, licenses and other products from La Vision offer not only an integrated solution for data capture and analysis of Wind Tunnel data, but La Vision's PIV software is also the most powerful PIV software in the industry and is the only product that meets or exceeds the Government's requirements. La Vision PIV systems, software and other products have repeatedly demonstrated a unique and innovative concept for the data capture and analysis of Wind Tunnel research services conducted at NASA/Ames, Langley, and Glenn Research Centers. Because PIV data capture and analysis is an ongoing area of research at no less than three of NASA's Centers, it is imperative that each Center utilize products and software that are guaranteed to provide a consistent data response and high quality analysis. This facilitates the ability of each Center to interact more quickly and with a substantial level of certainty that the data being captured and analyzed is reliable and interchangeable whether it has been captured at Ames, Langley, or Glenn Research Centers. For this reason, these Centers have been utilizing La Vision's products for nearly 5 years. La Vision provides a unique, innovative, and commercially available concept in the design of its PIV software and related products, and is the only current source that meets, or exceeds, the Government's requirements.

E. Description of efforts made to ensure that offers are solicited from as many potential sources as is practicable, including whether a notice was or will be publicized as required by *FAR Subpart 5.2* and, if not, which exception under *5.202* applies.

A Synopsis was posted in NAIS and FedBizOpps on August 5, 2011 with no responses.

F. A determination by the Contracting Officer that the anticipated cost to the Government will be fair and reasonable.

The Government anticipates that costs to the Government will be fair and reasonable based on a comparison of prices paid previously through the vendor's published price lists and with prices obtained through market research for the same or similar items.

G. Description of the market research conducted and the results or a statement of the reason market research was not conducted.

Market Research:

During the most recent market research efforts in May 2011 at NASA/Ames Research Center, the following supply sources were checked in the course of conducting Market Research.

SEWP Contract: Confirmed that products meeting these specific Government requirements for PIV software, hardware and associated products are not available through the SEWP Contract.

GSA Schedule 70 SIN 132-34: No Vendors capable of fulfilling this requirement were found on this schedule. An additional Small Dynamic Business Search using NAICS Code 541512 and keywords "Da Vis" and "PIV Software", but no vendor results were returned.

NASA Vendor Database: A search was conducted using NAICS Code 541512 against the Veteran-Owned Small Business check box and found over 190 vendors, however, none of these vendors is able to market and sell Da Vis Software Licenses, Software and Software Upgrades.

The currently used commercial PIV system is an integrated system, the software and hardware of which is not compatible with other products from other manufacturers with similar features.

The buyer received an email from La Vision, Inc., which confirmed that the Da Vis Software, software upgrades. and software licenses are not available through any other source apart from La Vision, Inc.

Similar results were obtained through previous market research efforts conducted at NASA Langley Research Center.

Additionally, the previous market research efforts which ranged from the original purchase in 2005 through the most recent purchase in May 2011 have found that while the commercially available systems offered by TSI and Dantec are in certain ways comparable, the systems nevertheless do not meet the Government requirements.

The system offered by TSI does not meet the Government requirements for:

1. On-line storage – The TSI system offers "Hyper-Streaming" which permits large amounts of data to be acquired but the process of transferring this information to disk is quite slow since the data has to be read from a buffer. At NASA Ames Research Center, the "on-line" storage requires that images are stored directly to disk as they are acquired. This feature is vital to ensure optimal efficiency when testing in large wind tunnels.

2. Self-calibrations – This capability is critical to NASA Langley Research Center since the measurement region is large and alignment with the light sheet is

somewhat difficult. This feature in the Da Vis software corrects for any misalignments between the target and the measurement plane and improves measurement accuracy.

3. "Open Source" Software – the "open nature" of the source code and macro programming language of the Da Vis software allows for fast adaptation of the imaging system in sophisticated research such as wind tunnel research, however, Da Vis software is not engineered as "plug-in" software and as such, cannot simply be plugged into a competitor's software. Conversely, TSI's Insight software is proprietary and does not permit end-user modifications to its software code. The Da Vis software is strongly preferred by NASA researchers due to this flexibility because it greatly improves its value, effectiveness and versatility as a research tool and platform for the many areas of focus in wind tunnel research."

4. Compatibility with Redlake ES 4020 Cameras – For Langley's application, the Center anticipates using multiple camera systems simultaneously. The NASA Subsonic Rotary Wing (SRW) project has made a significant investment in Redlake ES 4020 cameras and would like to leverage these resources. As such, compatibility with existing hardware is a major requirement. TSI offers Powerview camera systems, but is uncertain whether their software and timing hardware are compatible with the Redlake ES 4020 cameras. Also, NASA Ames has a large investment in the ES 4020 cameras, which LaVision has integrated in the data acquisition system purchased in 2010.

The Dantec system does not meet the Government's requirements including the requirement to integrate all components of a PIV system.

H. Any other facts supporting the use of other than full and open competition.

Facts supporting the use of other than full and open competition are set forth in paragraph C. of this document.

I. Listing of the sources, if any, that expressed, in writing, an interest in the acquisition.

Deadline for questions was established as Wednesday, August 10, 2011 and Statements of Capabilities were due on Friday, August 12, 2011. As of Tuesday, August 16, 2011, neither questions nor Statements of Capabilities were received.

J. Statement of the actions, if any, the agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required.

Any action would require replacement of all existing hardware and software currently being used, unless La Vision allows others to distribute their proprietary hardware and software. Following this five year BPA, the Government will review any new technology developments to determine if other commercially available systems meet the Government's requirements.

Signature Page:

I certify that the facts presented in this justification are accurate and complete.

Requirement Initiator:
Photographic Technologist
James T. Heineck

Signature *Date* 08/25/2011

I hereby determine that the anticipated cost to the Government will be fair and reasonable and certify that this justification is accurate and complete to the best of my knowledge and belief. *[FAR 6.303-2(a)(12)]*

Contracting Officer:
Ronnee R. Gonzalez

Signature *Date* 8/25/11

CONCURRENCE:

Directorate Manager:
Frank J. Kmak

Signature *Date* 8/25/11

Procurement Officer (Acting):
Kelly G. Kaplan

Signature *Date* 9/21/11

Center Competition Advocate:
Deborah L. Feng

Signature *Date* 9.23.11